CLAIMS

What is claimed is:

1. A method for detecting a target volume in radiotherapy or radiosurgery, said method comprising:

positionally referencing at least one implant in the vicinity of the target volume;

inductively stimulating the at least one implant;

detecting emission from the at least one inductively stimulated implant;

determining a position of the at least one implant based on the detected emission; and

determining the current position of the target volume based on the determined position of the at least one implant.

2. The method as set forth in claim 1, further comprising:

introducing the at least one implant into the patient in the vicinity of the target volume;

detecting the position of the at least one introduced implant using an imaging system before a radiation treatment;

referencing the at least one introduced implant relative to inner organs or other body structures.

3. The method as set forth in claim 2, further comprising:

after detecting the position of the at least one introduced implant, moving the patient to a therapy device;

at the therapy device, generating a dynamic electromagnetic field in the vicinity of but outside the patient, wherein the at least one implant inductively absorbs energy via the electromagnetic field and the at least one implant at least partially re-emits the absorbed energy in the form of a second electromagnetic signal;

detecting the second electromagnetic signal outside the patient; and

determining the position of the at least one implant relative to measuring points at which the second electromagnetic signal is detected, the position of said measuring points relative to the therapy device being known.

4. The method as set forth in claim 3, further comprising:

determining the current position of the target volume based on the determined position of the at least one implant and knowledge of the position of the patient's inner organs relative to the at least one implant.

5. The method as set forth in claim 4, further comprising:

shifting the patient such that the target volume can be captured by a therapy beam from the therapy device.

6. The method as set forth in claim 4, further comprising:

adjusting a therapy beam from the therapy device to the current position of the target volume.

7. The method as set forth in claim 4, further comprising:

continuously detecting the position of the at least one implant; and

based on the continuously detected position, determining a shift in the position of the target volume caused by breathing.

8. The method as set forth in claim 4, further comprising:

based on the current position of the at least one implant, activating the therapy device only when the position of the target volume is within a predetermined range about a current target point of the therapy device.

9. The method as set forth in claim 8, wherein knowledge of the current position of the target volume within the patient is used to adjust the therapy device such that the target point of the therapy device follows the shift of the target volume.

10. The method as set forth in claim 3, wherein the measuring points are situated on a rotating portion of a linear accelerator.

11. The method as set forth in claim 3, wherein the measuring points are integrated into a treatment couch of the therapy device.

12. The method as set forth in claim 3, wherein one or more measuring points are attached to a solid, mobile structure which position relative to the therapy device is tracked three-dimensionally by means of a real-time tracking system.

13. The method as set forth in claim 2, wherein the at least one implant includes one or more coils.

14. The method as set forth in claim 13, wherein the at least one implant includes a number of coils whose axes are not parallel to each other.

15. The method as set forth in claim 13, wherein the coils in the at least one implant are connected to different oscillating circuits having different resonance frequencies.

16. The method as set forth in claim 1, wherein:

while the at least one implant is tracked, the patient is situated in a space or region of a space in which there are as few interference fields as possible and in which there are as few metallic parts as possible;

the position of the at least one implant relative to measuring points is determined;

the measuring points are fixedly connected to the patient or to a couch on which the patient is lying;

the measuring points are fitted with a reference means which allows the position of the measuring points to be determined using an independent, three-dimensional tracking system;

after electromagnetic measuring, the patient is moved to a therapy device in such a way that the spatial relationship between the patient and the measuring points is not changed; and

the patient is positioned relative to the therapy device by way of the reference means.

17. The method as set forth in claim 16, wherein the independent, three-dimensional tracking system is an optical infrared camera system.

18. The method as set forth in claim 3, wherein:

at least one of the steps is performed in a space adjacent to a treatment position; and

a tracking system additionally tracks the movement and position of external infrared markings, wherein the position and movement of the implant is referenced with respect to the position and movement of the external markings, and wherein positioning, gating and/or beam tracking are based only on tracking the external markings.

19. A method for recording diagnostic, two-dimensional or three-dimensional image data sets in accordance with breathing, said method comprising:

introducing at least one implant into the patient in the vicinity of the target volume;

inductively stimulating the at least one implant;

detecting emission from the at least one inductively stimulated implant;

determining a position of the at least one implant based on the detected emission; and

recording image data based on the position of the at least one implant.

20. The method as set forth in claim 19, further comprising:

at the imaging system, generating a dynamic electromagnetic field in the vicinity of but outside of the patient, wherein the at least one implant inductively absorbs energy via the electromagnetic field and the at least one implant at least partially re-emits the absorbed energy in the form of an electromagnetic signal;

detecting the electromagnetic signal outside the patient;

determining the position and/or orientation of the at least one implant relative to measuring points at which the electromagnetic signal is detected, the position of said measuring points relative to the imaging system being known; and

based on knowledge of the position of the at least one introduced implant, causing the imaging system to record data only when the position of the implant is within a tolerance range within the patient.